REMARKS

Claims 1, 8-12, and 14-30 are pending. In the interest of efficient prosecution, Applicant notes that these claims were present in this form at the end of prosecution for the grandparent application – ser. no. 09/292,081, filed 4/14/99 and issued as U.S. Pat. No. 6,423,380. The Examiner rejected those claims in an Office Action dated 1/15/02 which, in turn, cited an earlier Office Action dated 5/31/01. (Copies of these Office Actions are included in appendices to this Preliminary Amendment.) Applicant canceled those claims in the grandparent application in order to issue the allowed claim. Applicant responds to the bases for rejecting those claims below.

I. Rejection of claims under section 102

The Examiner rejected claims 1, 8-11, 21-22, and 25-27 as being anticipated by Adams (U.S. Pat. No. 5,395,803). Applicant contends that the claims contain limitations that are not disclosed in Adams. Claim 1, for example, requires moving a nozzle *exclusively* between a first point above a substrate's central point and a second point above an edge of the substrate. Adams, on the other hand, discloses moving its dispensing tube *in a spiral* from a point near a wafer's periphery toward the wafer's center. (Adams at Fig. 4.) Adams' spiral moves its tube to places other than those that are exclusively between a first point above a central point and a second point above an edge of Adams' wafer. Thus, because Adams violates the exclusivity of motion required by claim 1, Adams cannot be read to disclose that limitation.

Claim 8 requires moving a nozzle *along* a radius. This is in direct contrast to Adams, which teaches moving its dispensing tube *across* the wafer's radius in following the spiral path required by Adams. (Adams at Fig. 4.) Having disclosed the exact opposite of at least one of claim 8's limitations, Adams cannot be read to anticipate that claim or its dependent claims 9-11.

Claim 21 requires defining a generally *non-reciprocal* direction of motion with a dispenser. Once again, Adams discloses the exact opposite of this limitation. Specifically, Adams defines a spiral direction of motion with its dispensing tube; and such a motion requires a reciprocal component. As a result of the contrary nature of Adams' disclosure, it fails to anticipate this claim. Dependent claim 22 benefits from this distinction as well as another. Claim 22 expressly requires that the act of defining a direction of motion with the dispenser

further comprise defining a generally *unidirectional* line of motion with the dispenser. Because Adams' dispensing tube moves in a spiral, the tube necessarily travels in many directions and hence defines *multi-directional* lines of motion. This point of contradiction between Adams and dependent claim 22's limitation further emphasizes the novelty of claim 22.

Claim 25 requires dispensing a fluid from a dispenser while it is moving *in only one direction* from an initial position to a final position. Adams, in direct contrast, requires depositing photoresist from a dispensing tube while it is moving *in multiple directions* – as illustrated by its spiral path. The direct contrast between Adams' disclosure and claim 25 prevents the anticipation of claim 25 and its dependent claims 26-27.

Applicant notes that the Examiner cited a portion of Adams that refers to its dispensing tube as moving "radially" inward toward its wafer's center. What must also be noted are Adams' legion of references to the spiral motion of its tube. The term can be found in the title of Adams' invention, in the Abstract, and in the Summary (col. 2, ln. 13); the term is expressed twice in the only independent claim of the patent – claim 1 (col. 4, ln. 56; col. 4, ln. 58); and the term is incorporated into all of the other claims of the patent, as they depend upon claim 1. Moreover, Adams uses the term in many other places in its text and illustrates that term in its drawings. (*See* col. 3, ln. 6; col. 3, ln. 7; col. 3, ln. 10; col. 3, ln. 13; col. 3, ln. 32; col. 3, ln. 33; and col. 4, ln. 12; FIG. 4.) As a result, Applicant presumes that Adams' use of the term "radially" to describe motion refers to the fact that the tube's motion begins and ends at points that coincide with the endpoints of the wafer's radius. Regardless of the exact interpretation, Applicant contends that it is untenable to interpret the portion of Adams cited by the Examiner as disclosing motion of the tube directly along the radius or as disclosing any of the limitations discussed above. Rather, the spiral motion required by Adams for its dispensing tube results in a disclosure that is contrary to those limitations. Because such contrary teachings fail to anticipate those claims, Applicant requests the withdrawal of the novelty rejections.

As mentioned above, this rejection first appeared in an Office Action dated 5/31/01 at page 3. Applicant traversed the rejection in an Amendment and Response transmitted 10/31/01, raising the arguments presented above. The next Office Action dated 1/15/02 maintained the rejection and responded to Applicant's arguments. Specifically, the Examiner responded by articulating a belief that Adams' dispensing tube does not move in a spiral; rather it moves radially, and spiral deposition is achieved by the tube's radial motion combined with the

spinning of the wafer. (Office Action dated 1/15/02 at p. 2.) The Examiner cited Adams' col. 3, lines 4-14, as well as FIGS. 2 & 4, for support. (***Id.***) Applicant contends that such citations actually refute the Examiner's reply and support Applicant's argument. Specifically, the cited text expressly states that "[s]piral 53 [of FIG. 4] indicates the approximate position *of the center of dispensing tube 35 as it moves . . . .*" (Adams at col. 3, ln. 10-12 (emphasis added).) Because the center of Adams' dispensing tube traces FIG. 4's spiral 53, so too must Adams' dispensing tube as a whole move along that spiral. Applicant further contends that Adams' FIG. 2 merely demonstrates that the tube's motion begins and ends at points that coincide with the endpoints of the wafer's radius.

As a result, the very text relied upon by the Examiner supports Applicant's conclusions that (1) it is untenable to interpret the portion of Adams cited by the Examiner as disclosing motion of the tube directly along the radius or as disclosing any of the limitations discussed above; (2) the spiral motion required by Adams for its dispensing tube results in a disclosure that is contrary to those limitations; and (3) because such contrary teachings fail to anticipate those claims, withdrawal of the novelty rejections is warranted.

II. Obviousness rejections under section 103(a)

The Examiner rejected some claims as being obvious in light of Adams in combination with Samuels (U.S. Pat. No. 4,457,259) and other claims as being obvious in light of Adams and Samuels in combination with Konishi (U.S. Pat. No. 5,250,114). Applicant addresses each basis for rejection separately below.

A. Obviousness rejections based on Adams in combination with Samuels

The Examiner rejected claims 12, 14-20, 23-24, and 28 as being obvious in light of Adams in combination with Samuels. In doing so, the Examiner acknowledged that Adams lacks adequate disclosure concerning these claims. In an attempt to make up for that, the Examiner cited Samuels as an indication that limitations concerning moving a nozzle over a wafer's diameter, spraying, and the spray being a mist, are known in the art. However, as indicated during prosecution of the grandparent application, it is insufficient to simply focus on

one part of a reference's disclosure in attempting to support an obvious rejection; rather, the Examiner must consider the reference as a whole. (***Interconnect Planning Corp. v. Feil***, 774 F.2d 1132, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985).) Moreover, the Examiner must articulate a motivation for one of ordinary skill in the art to combine the references. (*See* ***United States Surgical Corp. v. Ethicon Inc.***, 103 F.3d 1554, 1564, 41 U.S.P.Q.2d 1225, 1233 (Fed. Cir. 1997), *cert. denied*, 522 U.S. 950 (1997).) Further, when the prior art contains conflicting references, the inability of each reference to suggest solutions to one of ordinary skill in the art must be considered. (*See* ***In re Young***, 927 F.2d 588, 18 U.S.P.Q.2d 1089, 1091 (Fed. Cir. 1991).) (Copies of these cases are included in appendices to this Preliminary Amendment.) Applicant contends that considering Adams and Samuels as a whole demonstrates that they conflict on a fundamental level which would discourage their combination. Moreover, they conflict on at least one of the very points the Examiner seeks to use as a basis for rejection.

The Examiner believes that it would be obvious to apply Samuels' nozzle motion across a wafer diameter to Adams' dispensing process. However, the teachings of Samuels' nozzle motion and Adams' dispensing tube motion conflict to the point that such modification is discouraged. Samuels discloses more than a nozzle motion that starts at one end of a wafer's diameter and ends at the other end; rather, Samuels specifies that its nozzle move in a straight line across the wafer. (Samuels at col. 5, ln. 35-37; FIG. 2 (illustrating the path of the nozzle with a dotted line over wafer 16).) Adams, on the other hand, teaches a spiral motion for its dispensing tube (Adams FIG. 4) which crosses and is therefore in opposition to the straight line path taught by Samuels. Given such a conflict, one of ordinary skill in the art would be discouraged from applying Samuels' nozzle motion to Adams' dispensing tube.

Further, when the references are considered as a whole, other inconsistencies arise that further discourage combination. For example, Samuels requires that the flow rate from its nozzle be constant. (Samuels at col. 2, ln. 33-34; col. 5, ln. 67 - col. 6, ln. 1.) In direct contradiction, Adams encourages changing the deposition rate. (Adams at col. 3, ln. 47-51; col. 3, ln. 52 - col. 4, ln. 34 (describing a specific example of changing the deposition rate); FIG. 5.) As another example of conflict, Samuels teaches one of ordinary skill in the art that its nozzle may stop at any point above the wafer. (Samuels at col. 5, ln. 60-62.) Adams, however, teaches against this, indicating that such a cavalier attitude concerning the endpoint of deposition could result in

dropping extra material on a critical part of the wafer, thereby creating undesirable unevenness. (Adams at col. 3, ln. 22-46.)

Thus, although the Examiner attempted to cite Samuels for particular examples of knowledge in the art, the Examiner must still meet the standards set forth in case precedent for a viable obviousness rejection. Specifically, the Examiner must consider the cited documents as a whole, including considering their conflicts that discourage a motive to combine. (***Interconnect***, 227 U.S.P.Q. 543 ; ***Ethicon***, 41 U.S.P.Q.2d 1225; ***Young***, 18 U.S.P.Q.2d 1089.) Applicant contends that, when Adams and Samuels are considered as a whole, their contradictory teachings discourage combination. Applicant further contends that the only way the Examiner could ignore the contradictions and narrowly focus on particular portions in an attempt to reject the claims is with the benefit of hindsight gained from the current application, which is an inappropriate basis for rejection. Accordingly, Applicant requests the withdrawal of this rejection.

As with the §102 rejection, this §103 rejection first appeared in the Office Action dated 5/31/01 (page 3-4); Applicant traversed the rejection in the Amendment and Response transmitted 10/31/01, raising the arguments presented above; and the next Office Action dated 1/15/02 maintained the rejection and responded to Applicant's arguments. In further continuity with the §102 rejection, the Examiner's reply only refutes the Examiner's rejection and supports Applicant's argument. Specifically, the Examiner replies by admitting that Samuels was relied upon in the rejection "merely" for particular points. (Office Action dated 1/15/02 at p. 2-3.) Applicant addressed the insufficiency of such a reply above. To further expound on such a reply: the Examiner's admission further supports Applicant's contentions that (1) the Examiner has failed to consider the cited documents as a whole; (2) the Examiner has failed to consider the reference's conflicts and their resulting inability to suggest solutions to one of ordinary skill in the art; and (3) the Examiner's ability ignore the references' contradictions and narrowly focus on particular portions of Samuels is based on improper hindsight.

Although the Examiner attempted to provide motives to combine in the response portion of the Office Action dated 1/15/02 (pages 2-3), Applicant contends that the vast differences between the references motivates one of ordinary skill in the art to avoid combining these references. For instance, such an artisan, keeping Samuels in mind, would view Adams as requiring undue device complexity given Adams' spiral dispensing tube motion, flow rate

alterations, and particularity in the dispensing tube endpoint. Conversely, the ordinary artisan, keeping Adams in mind, would view Samuels as risking uneven coating (that would induce variations in critical feature size) given Samuels' straight line nozzle motion, constant flow rate, and lack of concern regarding nozzle endpoint.

B. Obviousness rejections based on Adams and Samuels in combination with Konishi

The Examiner rejected claims 29-30 as being obvious in light of Adams and Samuels in combination with Konishi. However, the conflicts between Adams and Samuels as discussed above render any combination involving those references, including this one with Konishi, untenable. Moreover, the Examiner committed same error as discussed above by focusing on only one part of Konishi. Case precedent previously cited indicates that the Examiner was legally bound to consider Konishi as a whole, and doing so would have indicated that Konishi adds further conflict between the references, thereby further discouraging this combination.

For instance, Konishi teaches against having only one wafer in its processing unit at a time, emphasizing that such a configuration allows the resist at the tip of its nozzle to harden by the time the processing of that wafer is complete, a new wafer is placed in the unit, and the new wafer is ready to receive resist. (Konishi at col. 1, ln. 38-47.) Konishi concludes that the hardened resist interferes with the ability to uniformly coat of the new wafer and in general decreases product yield. (***Id.***) This is in contradiction to both Samuels and Adams, which suggest that processing one wafer at a time is acceptable. (*See* Samuels at FIG. 2 and 4; Adams at FIG. 2 and 4.)

Konishi's deposition process provides other examples of conflict. Konishi actively teaches dropping resist on the wafer only while its nozzle is over the wafer center. (Konishi. at col. 4, ln. 52-55; *see also* col. 5, ln. 19-21 (teaching preventing resist from dropping while the nozzle is moving)). Konishi further indicates that accuracy in nozzle placement is not necessary, as it is acceptable to position its nozzle "substantially" over the wafer center. (***Id.***) Konishi concludes that that its spinning wafer will evenly distribute the resist. (***Id.*** at col. 6, ln. 42-44). Adams, in contrast, emphasizes the unlikelihood of modern devices being able to position the nozzle over the wafer center. (Adams at col. 1, ln. 61-64.) In further contrast, Adams emphasizes the importance in accurate placement of the nozzle. (***Id.***) Such teachings support

Adams' conclusion that attempts to deposit resist at a spinning wafer's center will result in uneven coating. (***Id.*** at col. 1, ln. 44-45.) As a result, Adams' conclusion is contrary to that of Konishi.

In further criticism of depositing only at the wafer center, Adams indicates that such a technique wastes resist, as it is necessary to dump more resist onto the wafer than is ultimately desired. (Adams at col. 1, ln. 24-44.) This not only further emphasizes the conflict addressed immediately above but also raises another point of conflict. Namely, Adams is so concerned about waste that it even discourages certain amounts of deposition over the wafer. (***Id.***) Konishi, on the other hand, will not only deposit over the wafer an amount that Adams considers excessive but also deposit even more resist that has no chance of reaching the wafer. Specifically, Konishi teaches performing "dummy dispensations" into a trench while its nozzle is distal from and waiting to service a wafer. (Konishi at col. 5, ln. 5-18.) Konishi encourages this in order to prevent resist at the nozzle tip from hardening, which could clog the nozzle. Thus, Konishi's dispensing process, both on and off the wafer, are in direct conflict with Adams' emphasis on avoiding waste. Alternatively, Adams' teachings of avoiding resist waste may result in clogging its nozzle, according to Konishi's teachings. Either way, the contrary teachings discourage the proposed combination.

Moreover, regarding Konishi's dispensing on its wafer, Konishi further teaches dispensing *only* at the center of the wafer, using suction to prevent resist from dropping from the nozzle while it is moving to or from that point. (Konishi at col. 5, ln. 19-21.) Adams teaches that, despite such "suck-back capabilities," drops of resist may still reach the wafer, thereby creating unevenness in the resist layer. (Adams at col. 3, ln. 22-32.) In addition to contradicting this specific point of Konishi, Adams conflicts on a more general level by teaching nozzle motion during deposition. (***Id.*** at FIG. 4.) Similarly, Samuels discourages Konishi-type processes by teaching that "it is necessary to repeatedly pass a spray nozzle over the surface many times in order to achieve the desired uniformity." (Samuels at col. 1, ln. 26-28.)

Thus, although the Examiner is attempting to cite Konishi for only one particular example of knowledge in the art, the Examiner must still meet the standards set forth in case precedent for a viable obviousness rejection. Specifically, the Examiner must consider the cited documents as a whole, including considering their conflicts that discourage a motive to combine. (***Interconnect***, 227 U.S.P.Q. 543 ; ***Ethicon***, 41 U.S.P.Q.2d 1225; ***Young***, 18 U.S.P.Q.2d 1089.)

Applicant contends that, when Konishi is considered as a whole, its teachings contradict those of Adams and Samuels and therefore discourage combination. Applicant further contends that the only way the Examiner could ignore the contradictions and narrowly focus on particular portions in an attempt to reject the claims is with the benefit of hindsight gained from the current application, which is an inappropriate basis for rejection. Accordingly, Applicant requests the withdrawal of this rejection.

As with the rejections addressed in other sections above, this rejection first appeared in the Office Action dated 5/31/01 (page 5); Applicant traversed the rejection in the Amendment and Response transmitted 10/31/01, raising the arguments presented above; and the next Office Action dated 1/15/02 maintained the rejection and responded to Applicant's arguments. In further continuity with the previous rejections, the Examiner's reply only refutes the Examiner's rejection and supports Applicant's argument. Specifically, the Examiner replies by admitting that Konishi was relied upon in the rejection "merely" for a particular point. (Office Action dated 1/15/02 at p. 3.) Applicant has addressed the insufficiency of such a reply above. To further expound on such a reply: the Examiner's admission further supports Applicant's contentions that (1) the Examiner has failed to consider the cited documents as a whole; (2) the Examiner has failed to consider the reference's conflicts and their resulting inability to suggest solutions to one of ordinary skill in the art; and (3) the Examiner's ability ignore the references' contradictions and narrowly focus on particular portions of Samuels is based on improper hindsight.

Although the Examiner attempted to provide a motive to combine in the response portion of the Office Action dated 1/15/02 (page 3), Applicant contends that the vast differences between the references motivates one of ordinary skill in the art to avoid combining these references. In addition to the differences between Samuels and Adams articulated in part A above, Konishi merely adds to the differences. For instance, such an artisan, keeping Konishi in mind, would view Samuels and Adams as inviting material to harden at the dispense point (thereby allowing non-uniform coating) given their allowance for processing one wafer at a time. That artisan, continuing to keep Konishi in mind, would view Samuels and Adams as requiring undue device complexity given their respective linear and spiral dispense motions in contrast to Konishi's stationary dispensing. Further, the ordinary artisan with such a mindset would view Adams as requiring undue device complexity in terms of the particularity Adams calls for in the dispensing

tube endpoint. In addition, the ordinary artisan with that mindset would view Adams as dispensing insufficient amounts on the wafer.

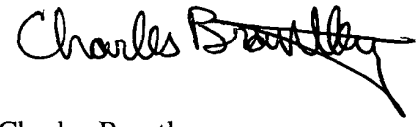
Conversely, the ordinary artisan, keeping Samuels and Adams in mind, would view Konishi as requiring undue complexity in terms of sizing devices to accommodate multiple wafers. Moreover, such an artisan, keeping Adams in mind, would view Konishi's efforts to drop resist at the wafer center as an unobtainable goal that wastes resist and results in uneven coating. That artisan, continuing to keep Adams in mind, would view Konishi as risking uneven coating (that would induce variations in critical feature size) given Konishi's lack of concern regarding precise nozzle centering. Moreover, an ordinary artisan applying Adams' standards would view Konishi's dummy dispensations as a further waste of resist. The ordinary artisan guided by Adams' teachings would also view Konishi's attempt to use suction to avoid dropping resist while moving its nozzle as another unobtainable goal that results in uneven coating despite the added device complexity required.

The Examiner concluded the response by announcing that non-obviousness is not shown by attacking references individually. Specifically, the Examiner cited ***In re Keller***, 642 F.2d 413, 208 U.S.P.Q. 871 (C.C.P.A. 1981) and ***In re Merck & Co.***, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Significantly, those cases addressed an applicant's attempt to distinguish the claimed invention from only one of a combination of references. (***Keller***, 208 U.S.P.Q. at 882 (refuting an attempt to distinguish the claimed invention from only the Walsh reference); ***Merck***, 231 U.S.P.Q. at 380 (refuting an attempt to distinguish the claimed invention from only the Petersen reference).) This proposition is not relevant to Applicant's arguments, as Applicant is not attacking individual references as they apply *to the invention.* Rather, Applicant is attacking the Examiner's decision to combine the references. Applicant can find no portion in the current or previous prosecution documents where Applicant compared the invention to the individual references in order to defeat an obviousness rejection. Instead, Applicant properly pointed out the differences between Samuels and Adams, Samuels and Konishi, and Adams and Konishi in an effort to show a lack of motivation to combine. Thus, while the Examiner's statement of the law may be correct, that law has no bearing on the current facts. Rather, the standards posed in ***Interconnect*** and ***Young*** are the relevant rules, and Applicant requests that the Examiner consider the impropriety of the Samuels/Adams and Samuels/Adams/Konishi combinations in light of those standards.

Conclusion

In light of the above amendments and remarks, Applicant submits that claims 1, 8-12, and 14-30 are allowable over the applied references. Therefore, Applicant respectfully requests reconsideration of the Examiner's rejections and further requests allowance of all of the pending claims. If there are any matters which may be resolved or clarified through a telephone interview, the Examiner is requested to contact Applicant's undersigned attorney at the number indicated.

Respectfully submitted,



Dated 9/5/3

Charles Brantley
Registration No. 38,086
Micron Technology, Inc.
8000 S. Federal Way
Boise, ID 83716-9632
(208) 368-4557

Attorney for Applicant